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Australia: the Coming Cotton Country.

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DEPARTMENT OF FARM MANAGEMENT.

A Crop that offers opportunity for all.

BY

C. H. CHOMLEY.

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AUSTRALIA:

THE COMING COTTON COUNTRY.

By C. H. CHOMLEY.

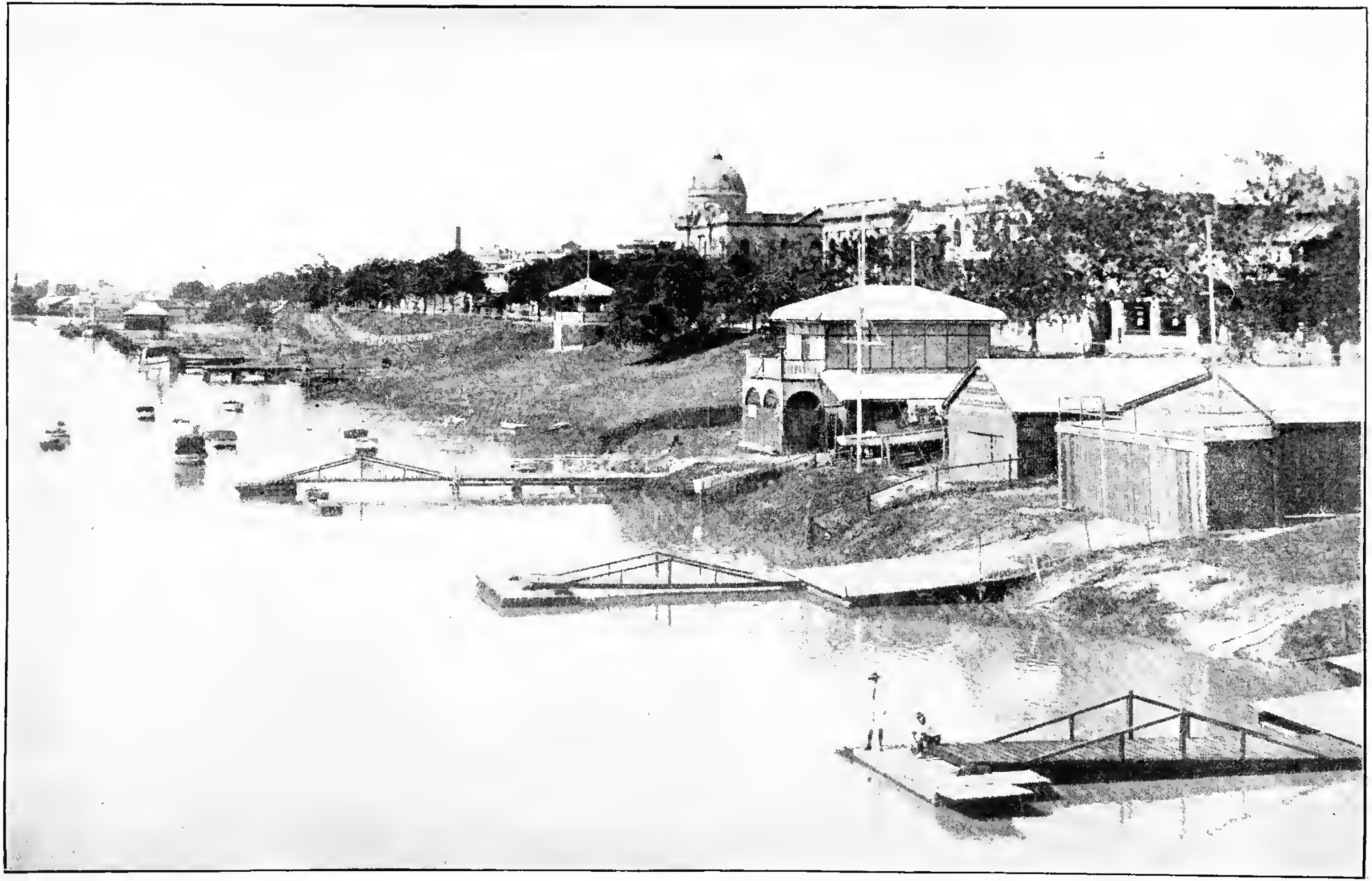
FOR sixty years or more Australia has grown cotton, and vaguely, from time to time, there has been talk of its growing more. Occasionally the cotton area has increased by a few paltry hundred acres, only to decrease again next year, but now an entire change has come over the scene. Already there are more thousands of acres under cotton than three years ago there were hundreds, and twenty-five years hence—perhaps sooner—Australia will be among the greatest cotton growing countries of the world.

This may seem to be overbold and optimistic prophecy, but it is based upon a number of facts, some of which will be set out in the following pages, in the hope that their dispassionate consideration will lead all who read them to agree that cotton is soon to become a gigantic industry in Australia.

Many causes have contributed to this development. In the first place the demand for cotton, though dislocated by the war, is constantly growing. Mr. John W. McConnell, chairman of the Fine Spinners' and Doublers' Association of England, states that 750,000 bales—a bale being reckoned at 500 lb.—is a fair estimate of the annual increase of the world's cotton requirements. The present main sources of supply to British mills are the United States of America and Egypt. Great quantities of cotton, mostly of an inferior quality, are grown in India and China, but the bulk of this is used locally, and little of it finds its way to the insatiable British market.

At the same time, production in the United States shows a tendency to decrease, owing to the prevalence of a pest known as the boll weevil, with which the negro labour employed so widely is not well fitted to cope, while every year the United States cotton mills use an increasing proportion of the cotton which their country can produce.

The production of Egypt, where a very fine quality of cotton is grown, has been expanding fast of late years, and doubtless will expand further still, but it is a mere drop in the bucket of the ocean of the world's needs, and the quantity of cotton which can ever be produced is inexorably limited by nature. Egypt, with its area of 350,000 square miles, is largely desert in the most uncompromising sense of the word, and the cotton country is limited to the Nile delta, and an irrigated strip on either side of the river, over a length of about 550 miles. This irrigated strip is often not more than a mile wide, and the total area in Egypt which is suitable for cotton does not exceed 12,500 square miles. Further conservation of the Nile waters may add somewhat to this fertile country, but it is obvious that the ten to twenty thousand square miles of Egyptian cotton lands are not comparable as a factor in production with the hundreds of thousands of square miles of potential cotton country in Australia—other things being equal. At present they are not equal, for Egypt has studied cotton growing



Fitzroy River, Rockhampton, Queensland—A feature Cotton Port scientifically, and pursued it industriously for a number of years—cotton was first grown commercially there in 1820—whereas in Australia the work hitherto done has been unscientific and spasmodic.

These conditions are rapidly changing, and before long every acre devoted to cotton in Australia will be sown with the best seed and tended with the same care as the most productive fields of Egypt. Then the possession of large tracts where cotton thrives will begin to tell, and Egypt's production will be surpassed.

On the day that it is equalled even, Australia will have added to her products a crop worth £30,000,000 a year; more than equal in an average year to the present value of Australia's wool, or wheat, or meat, or butter, the main staples of her agricultural wealth.

That Egypt on 12,500 square miles produces annually some £30,000,000 worth of cotton, yielding to its cultivators about £15 an acre profit, in addition to the revenue from other crops grown upon the same land, is a fact that Australia, which has all of Egypt's facilities for cotton culture, should never forget.

Here is what Profesor John A. Todd, the leading authority, has to say of Egypt in his book "The World's Cotton Crops." "The Egyptian crop," he writes, "is small, but of very great value—£30,000,000 worth per annum produced from less than 2,000,000 acres—which incidentally produce other crops during the twelve months sufficient to cover the whole cost of production of the year's crops, giving a sheer surplus of, on the average, £20 an acre. No wonder that rents are high, £10 to £15 per acre per annum is quite a common figure; and the price of good cotton land is anything from £100 to £200 per acre."

There are, of course, other countries besides Egypt which can produce cotton, and in all of them which lie within the British Dominions the British Cotton Growers' Association is most anxious to encourage production, but everywhere, except in Australia, there are many difficulties in the way. Cotton, to be of use in Manchester, must not only be grown but transported to market. and in the tropical African Colonies of Britain this involves the building, at great cost, of roads, and railways, and harbours, which are already built and available in many districts suitable for cotton in Australia. Further, in these countries. capital and supervision must come from Britain, and uneducated black labourers must be taught the business of cotton growing, and American experience has abundantly shown that negroes, after they and their fathers have cultivated cotton for scores of years, are nothing like the equal in efficiency of white men. who only yesterday learned the work. The increase of cotton growing on the irrigated lands of Western America, where high yields of good quality are obtained by white growers, is conclusive evidence of this. It is hardly too much to say that negro labour, is rather a handicap than an aid to cotton growing to-day.

To return to the other parts of the British Dominions to which Britain may look for cotton supplies, there remain India, British Guiana and Australia. In the former two something will be done, but India, as already said, uses much of her own cotton, which is of poor quality, and exports to Japan, and it is considered a mistake by those in authority to divert much land to cotton growing from the growing of food.

Therefore there remain as the source likely to contribute most to the needs for cotton of the world in general, and Britain in particular, the continent of Australia, with an area equal to that of the United States. and cotton lands of unproved extent, but certainly not less than some hundreds of thousands of square miles.

Before the war the world's annual consumption of cotton was enormous, far exceeding that of all other fibres. Mr. McConnell, already quoted, puts the figures at follow:—

Pre-war requirements of fibre per annum:

Cotton	5,400,000 tons.
Wool	1,250,000 ,,
Flax	500,000 ,,
Silk	24,000 ,,

Of the wool, Australia already produces a greater share than any country, amounting to nearly 800,000 tons. In cotton, the United States is almost as pre-eminent, its total yield in the years 1910-14 being nearly 15 million bales of a world total of 26 million bales.

This state of things, however, cannot continue indefinitely. As Mr. McConnell says: "Broadly speaking, in all the history of our industry, Great Britain has been dependent on the United States for three-fourths or four-fifths of her supplies of raw cotton. There are many good reasons why it would be most unwise for us to expect that we can continue in the coming years to obtain anything approaching such a proportion of our requirements from the United States. Her crop is probably approaching its economic limit. Her own consumption is increasing. Her climate is variable, and the size of her crops is subject to corresponding variations, and it would benefit not only us, but all the world if the sources of supply were more widely spread."

Much more could be written upon the necessity for Britain and the world to increase its supplies of cotton, but enough has probably been said here to satisfy any Australian that there will be an unfailing demand at steady prices for any contribution to the cotton market that his country is able to achieve Recognition of this demand is the first and most important factor in the revived activity in cotton growing in the Commonwealth.

The Australian Cotton Growing Association.

The demand being assured, the next thing required was patient, comprehensive, and methodical enquiry into the capacity of Australia to meet any large proportion of it, with a profit to the growers in the immediate future. Very fortunately for the Commonwealth, this has been forthcoming through the activities of the Australian Cotton Growing Association, in the work of which two men, both of them native-born Australians, have taken a specially prominent part. These two are the Hon. Crawford Vaughan, formerly Premier of South Australia, and Mr. H. C. Armstrong, formerly director and general manager of the Remington Co. in Victoria.

On the recommendation of the British Cotton Growing Association and the London Chamber of Commerce, Messrs. Vaughan and Armstrong engaged the services of Mr. W. H. Johnson, formerly Director of Agriculture in Nigeria, to accompany them on a comprehensive tour of investigation and to make a report. They then travelled extensively in the United States and Egypt, and other cotton growing countries in order to learn everything possible with regard to the production of cotton there; and also in Australia, in order to ascertain, in the light of their experience, what parts of the Commonwealth offer the best promise of repeating, and perhaps of excelling, the success of cotton cultivation obtained elsewhere.

The work of the Association is by no means confined to enquiry and report. Its practical contribution to the commercial production of Australian cotton on a large scale is immense. Items in it are the purchase and supply to growers of the best seed for sowing on different types of Australian land; the erection of ginneries for treating the raw cotton in the most modern and efficient way; and the provision of expert assistance and advice to those embarking upon cotton growing in the Commonwealth. Already the Queensland Government had given revived impetus to the industry by guaranteeing to growers, not only in Queensland, but in Northern New South Wales also, a minimum price of 5½d. per pound for seed cotton up to the middle of next year, and by providing seed for sowing. It also erected a small ginnery for separating the lint from the seed.

In this way the Government has greatly stimulated progress. It was, however, without the benefit of the store of skilled knowledge gradually accumulated by the Australian Cotton Growing Association within the last two years; the seed distributed by the Government was not always of the best; and the facilities it could offer for ginning were inadequate for commercial purposes and out of date. Realising this, the Government of Queensland, with statesmanlike regard for the expansion of the industry, has recently arranged with the Association that, on terms agreed, it shall have general supervision of cotton cultivation in the State, making itself responsible for the supply of the most suitable seed and for the ginning of the cotton by the best and most modern gins which can be obtained, and which are specially suited for treating the various types of cotton that Australia is likely to grow with the greatest profit.

Two of these ginneries, one of which is illustrated here, are already in operation in Queensland, at Brisbane and Rockhampton, while two other smaller ones are being erected in New South Wales and in South Australia, where splendid results have been obtained on the irrigated lands, but where cotton growing is still in the experimental stage.

Mr. A. C. Armstrong and The Hon. Crawford Vaughan.

(Directors of Australian Cotton Growing Association).

The ginneries in Queensland, on the other hand, are great commercial enterprises, embodying all the most recent practice in treating cotton, and that now in operation at Rockhampton is capable of turning out 4,000 lb. of cotton per hour.

There is no doubt that the ginneries so far erected will be taxed to their utmost capacity, and that others will be quickly needed. Mr. Armstrong, who returns in a few days to Australia, via America, informs me that requests have already come to the Cotton Growing Association for seed to grow 77,000 acres of cotton in Queensland alone. A fortnight ago the demand amounted to 55,000 acres, and as cotton planting does not usually begin until about October, there is still a probability of increase.

An All-important Delegation.

To treat the produce of the land destined for cotton in the coming season it will be necessary to buy still more machinery, and Mr. Armstrong will give this matter his attention when he travels through the United States. On this visit he accompanies a delegation of some of the leading men in the British cotton world, who, with considerable sacrifice to their immediate business interests, have patriotically accepted a statesmanlike invitation from the Commonwealth Government to visit Australia to enquire into the whole matter of cotton growing there, with the special object of finding out and developing its capacity for supplying British markets, and thus helping to make the Empire self-sufficing in this prime necessity of manufacture and trade.

The delegation, which will spend some months in Australia, includes Mr. B. Crompton Wood, C.B.E., of Messrs. Smith, Rathbone and Co., a man who has huge dealings in cotton and very great experience; Mr. Harold Parker, of Messrs. William Calvert and Co.; a representative of Messrs. Blewitt and Co.; and Mr. W. P. Ascroft, a well-known Australian, who arrived in London some time ago, a partner in a prominent Commonwealth firm. but is now devoting himself to the work of the Australian Cotton Growing Association.

Mr. Crompton Wood and Mr. Parker, after a study of the facts and figures which Mr. Armstrong has been able to put before him, are very optimistic as to the future of the cotton industry in Australia, but being cautious men will wisely express no definite opinion until they have visited Australia and seen what is actually being done there.

The growing of the plant is only one item in the establishment of a successful cotton industry, the marketing of it being of equal, if not greater, importance. It is in this that Mr. Crompton Wood and others associated with him are rendering incalculable service to Australia and the Empire. Having seen what we can grow, they are prepared to give us the benefit of their experience as to what types are best suited to the varying market needs, and in helping us to place them where they are required. There could be no more hopeful augury for the cotton industry in Australia than the tour of these gentlemen under the auspices of the Australian Cotton Growing Association.

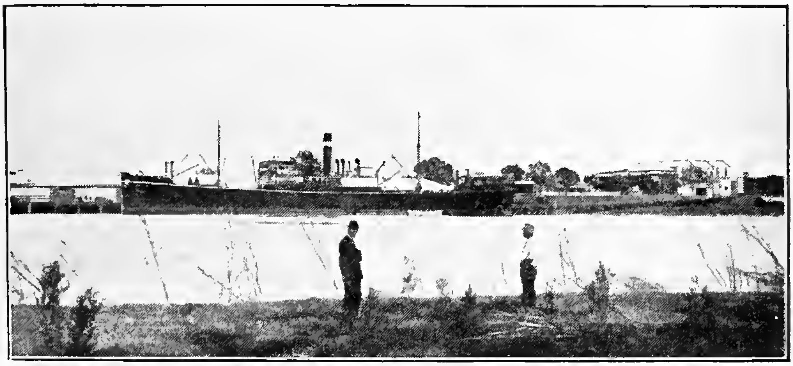
Mr. Armstrong's Views.

Interviewed before his departure as to the immediate outlook and future prospects of the industry, Mr. Armstrong spoke as follows:—

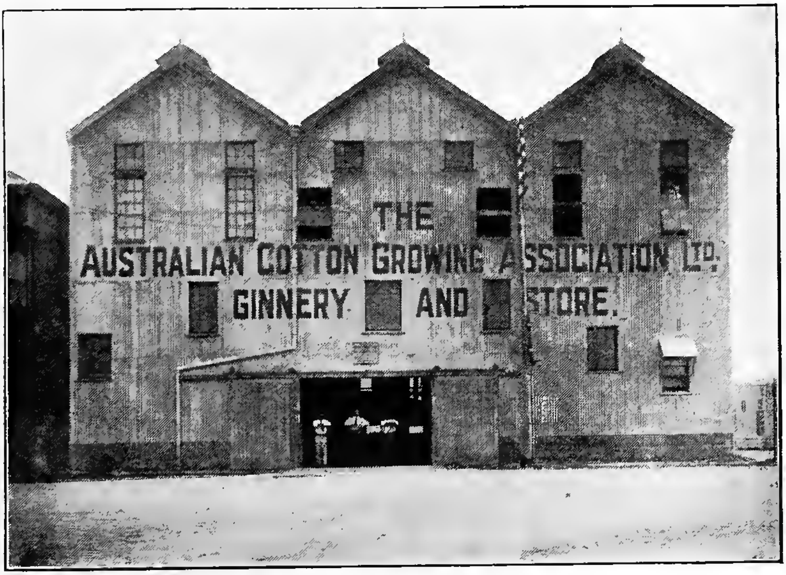
"The extremely rapid developments which have recently taken place regarding cotton cultivation in Australia must not be permitted to produce unhealthy boom conditions. It is not going to become a great industry overnight. The greatest care needs to be exercised in a number of directions, for the methods adopted in the early stages will determine the future.

"Judged in the light of conclusions reached after two years of careful preparatory work, and after studying the conditions obtaining throughout the world, it is apparent that a great opportunity exists for Australia to play an important part in future cotton production for British consumption.

"The work involved in reaching the present promising position has not been simple. There were many questions to deal with and comparisons to make, and our investigations all the way around the world, assisted by the best expert advice, aimed at doing this soundly. We have been faced more than once with the necessity of answering people, including certain Australians, who have expressed themselves in rather more emphatic terms than their information warranted. Some of them, possessed of such facts as the armchair furnishes, made statements which suggested that the demands of labour would be so excessive as to prevent successful cotton growing. It is pointed out elsewhere that the settler will in the early stage plant only such cotton as he and his family can handle. On this basis alone there can be substantial production. As development progresses, however, with the establishment of subsidiary industries which will necessarily follow, it is obvious that the addition which the whole will make to the wealth of Australia will be appreciated.



Fitzroy River, Rockhampton.



Rockhampton Ginnery and Store.

"We have now operating two large ginning plants and two small ones. We are purchasing several more immediately, and plans are being drawn for the erection of an oil-crushing mill. When types of staple are determined, and quantities sufficient to justify it are produced, other manufactures will be entered upon. All this, with its capacity to absorb workers, presents too attractive a picture for labour not to be seized with its importance, and to enter most wholeheartedly into the extension of its scope to the fullest degree possible.

"Every shilling which enters Australia in payment for raw cotton is one that was not there before. Every gallon of oil produced by the mill means the retention within the country of its cost. These are palpable facts, needing no enlargement. Australia can become a cotton producer on the basis of the settler limiting his planting to the picking capacity of his family. It is on this plan that the Association has based its recommendations, and its soundness brooks no criticism. Community picking will probably permit considerable extension of planted areas, and if, as with fruit, casual labour is available from populous centres, there can be still further increases. Expert pickers will soon develop in this event, and a sound economic rate per pound should be struck, mutually acceptable to grower and picker.

"The absence of the chief pests of the cotton plant from Australia is a condition that every effort must be made to maintain.

Good Quality Essential in Australia.

"An absolute control of all seed is essential, and effort must be directed to the production of good quality staple. This Australia can certainly produce, and as its value is substantially higher than middling American, care should be taken to keep up its standard. The quantity harvested in Australia per acre is also considerably above American averages. Thus the return, both as to quality and quantity, is in favour of the Australian grower, a fact largely attributable to the better methods of white cultivation.

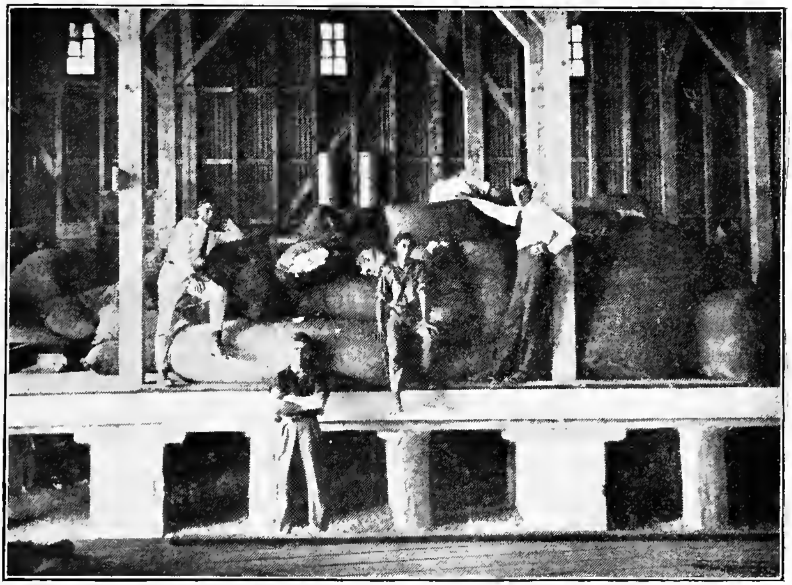
"It was illuminating, when visiting the Southern States of America, to note how emphatic was the call for whites to be sent to stem the boll weevil ravages. With the inherited habits of generations, it is admitted that the negro is no match for it. He is unable or unwilling to adapt himself to new methods, and in this fact lies Australia's great opportunity. The splendid natural conditions which apply, selected seed and good cultivation, will mean high quality and quantity return. Up-to-date treatment is the next step. With regard to baling, Lancashire will not be slow to show her approval of improvements over American methods, which are not by any means all that is to be desired.

"Boiled down, cotton offers to the settler—and particularly to the new settler—a quick cash crop. It will be one of several. There is no suggestion that it shall be the only crop. Proper rotations must be arranged, and it shall be part of the Association's duties, through its experts, to direct suitable subsidiary crops in sequence, or side by side, with cotton.

"A large amount of work has been done—a great deal remains to do—but it is confidently expected that cotton will provide a means for the more rapid assimilation of immigrants into the wide spaces of Australia. Compliment must be paid to Mr. Crawford Vaughan for the dream of cotton as a great Australian industry, with all its immense subsidiary possibilities. It has been my privilege to join hands with him, and to crystallise the nebulous into the practical. Associated with this effort have been people to whom the prospect of mere market profit offers no attraction. The Australian Cotton Growing Association may almost be classed as a Lloyds' baby, for a group of Lloyds' underwriters were the first to undertake, with Mr. Vaughan and myself, the cost of a serious examination of Australian possibilities in relation to the establishment of cotton growing as a new industry. Lord Beatty and Sir Rennell Rodd, ex-Ambassador for Rome, are amongst those who have identified themselves with this objective. Lord Beatty's inquiry of me when he joined the Association: 'Are you going to take some of my men?' characterises the purpose which stimulated the interest of those constituting the effective members of the Association. Mr. Vaughan has done amazing work in Australia in awakening the people to the possibilities it affords for the quick assimilation of immigrants, and to the advantage it gives to the existing settler for tapping a new source of revenue

"Cotton has become a word to juggle with in Australia, and there have been a number of approaches to us to permit public flotation for the exploitation of the public enthusiasm which has been awakened. Our work has gone on, however, without recourse to the public purse, and, as it has been necessary, we have found the money for development amongst ourselves. The soundness of our effort to build a solid foundation to a

Cotton Growing between Rows of Vines at Renmark, South Australia.



First ten tons of Cotton received at Rockhampton Ginnery.

proud enterprise has made its appeal to Lancashire, and we have now been joined by practical consumers and distributors of cotton, who find attraction in the prospect cotton cultivation holds for the development of a Continent.

"Australia is 'White Australia.' I have spent some years in America, and I have no desire to see it other than 'White Australia.' This is dictated by a real knowledge of the colour question. It is 'up to the settler.' Proper control, selection of seed, and good cultivation—these constitute the solution of the problems which lie in front.

"It has been my privilege to effect affiliation with a group of Lancashire men who see the value from an Empire standpoint of building a cotton industry in Australia, and to whom the ideals of a White Australia make a strong call.

"The Prime Minister has shown his approval of what has been done by issuing an invitation for a delegation to visit Australia. In response to this a representative party starts to Australia, via New York, by the *Berengaria*, on the 19th inst. A supplementary invitation has been received from the Queensland Government, which asks that the delegation shall be its guests while visiting that State. It is in Queensland that the most practical work has been undertaken, and if, as it is confidently believed, Australia as a whole becomes a cotton producing country, the honours of initiating the industry must lie with Queensland.

In Queensland, which, as Mr. Armstrong says, has the honour of initiating the industry, its revival and expansion are pre-eminently due to the present Premier, Mr. Theodore, who has given all possible encouragement to the growers, and forwarded the work of the Cotton Growing Association in every way.

"I would like to take this opportunity, on behalf of the Association, of expressing appreciation to the High Commissioner for Australia, Mr. Shepherd, Official Secretary, Mr. Fihelly, and the Agents-General of the various States, for their great courtesy and assistance in our endeavours to make cotton a serious enterprise for Australia. It has been for us to study the question specifically, but their attitude has helped materially in bringing matters to their present satisfactory position. The same remarks apply to Sir James Currie, chairman of the Empire Cotton Corporation, and to Mr. W. H. Hinebury, general manager of the British Cotton Growers' Association, from whom we have experienced the warmest co-operation.

"In company with Mr. Vaughan and an expert, I have covered the world. While in England I have visited a multitude of cities and small towns. Britain is congested, and Europe is stagnant. In Australia we have God's sunshine, fresh air, and broad acres.

"The war has taught us the wisdom of retaining Britain's surplus population within the Empire. Cotton looks as though it will quickly convert the drawer of the dole into a producer of wealth. We have practical hands at the helm in our enterprise. It only wants concerted effort from labour and producer, and there is no limit that can be set on the possibilities of the new industries which are bound up with cotton, and the wealth which they can add to Australia."

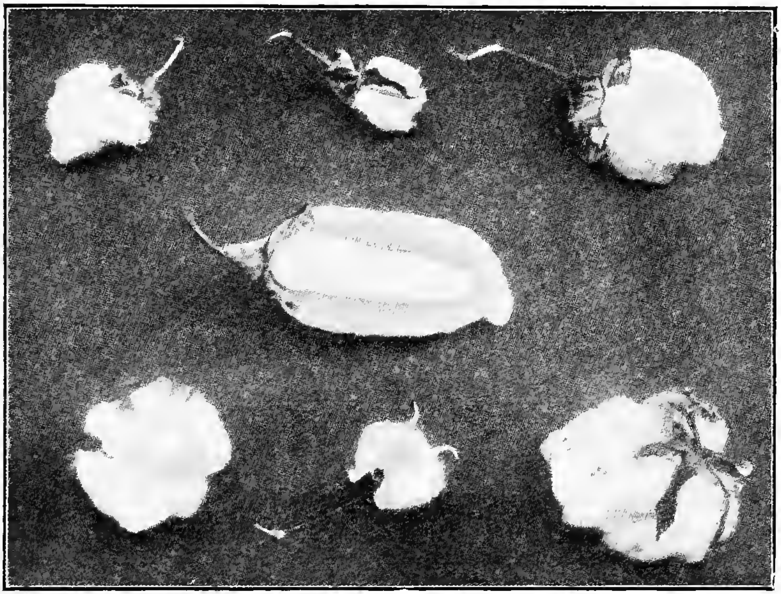
Varieties of Cotton.

Cotton is a plant of infinite variety and very wide habitat, for it is found wild or cultivated in lesser or greater quantity in every country of the world which provides it with a suitable climate. Its requisites are very considerable heat during the time of growth and ripening, and plenty of water. This must be supplied either by a well distributed and ample rainfall, or by irrigation. It is essential that the plant should have moisture during the last few weeks before it is ready for picking. In this it does not differ greatly from wheat, which, as we know too well in Australia, may be ruined and worth practically nothing, if there are not good rains when the ear is beginning to swell.

According to the Atlas of American Agriculture, which deals exhaustively with cotton, thirty-eight principal commercial types are recognised at Liverpool, the chief cotton market of the world. A broad grouping gives five general classes of cotton, which are illustrated here.

The first, Sea Island cotton, is a native of the West India islands, and is the most valuable of all, since it surpasses all other types of cotton in length, strength and fineness. The fibre is two inches in length, and sometimes even longer. The best Sea Island cotton is grown on the islands and mainland along the coast of South Carolina. It is grown also further inland, where the staple is not quite so long, and the other special qualities of silkiness and fineness, which appear to depend upon proximity to the sea, are not quite so marked. Only about 100,000 bales ot this cotton are produced annually in the United States, and about 10,000 bales in the West Indies.

Next to Sea Island in length and fineness comes Egyptian cotton, which resembles it considerably, but most of its varieties are of brown colour in varying shades. Recently some white cottons have been established in Egypt, and they are serious competitors with Sea Island. It is not quite so long as Sea Island, having a staple from 1⅜ to 1¾ inches in length. Cotton constitutes the principal wealth of Egypt. In the years between 1910 and 1916 about 1,400,000 bales, grown upon an area not exceeding two million acres, were produced annually, of a value as previously stated, of about £30,000,000 yearly. The United States imports from 150,000 to 350,000 bales of this cotton, and in 1916 grew about 7,000 bales in the Salt River Valley of Arizona. The land there, like that of Egypt, would be sterile without irrigation, but yields splendid crops when the water is put upon it. The fact that Egyptian cotton has been successfully developed and acclimatised in the irrigation settlements of America is an example of very great interest to Australia, where we hope to grow good cotton on our irrigated lands.



Various types of Cotton in the Pod.

The third type of cotton is known as upland long staple, and is from about 1⅛ to 1½ inches in length. It is grown chiefly in the United States, and comes next in value to Egyptian, competing with it for some purposes. The production of long staple cotton in 1915 was estimated at 800,000 bales.

Upland short staple, the fourth great class, is at present undoubtedly the most important commercially, for it constitutes about 92 per cent. of the cotton crop of the United States, and nearly 60 per cent. of the total world's crop of 25,000,000 bales. The standard short staple grade, known as American middling, is the basis of price quotations for all short staple cottons, other prices being reckoned at so much below or so much above American middling. This cotton is comparatively short, being ordinarily ⅝ to 1 inch long, though some varieties, under favourable conditions, grow a little longer. The upland short staple has hundreds of varieties, some of which have been introduced into Russian Turkestan and Trans-Caucasia, where they now constitute the greater part of the crop. In both these countries there is a very small rainfall, but the cotton lands, which are irrigated, give very heavy crops, amounting sometimes to 1,500 lbs. of seed cotton, which is equivalent to 500 lbs. of ginned cotton per acre. Upland short staple is also grown in India, China, Africa, Asia Minor, and Brazil.

The fifth great class is that of Asiatic cotton, which includes several hundred botanical species. The staple is very short, being from ⅜ to ¾ of an inch long, but strong and rather rough. This Asiatic cotton is grown in India, China, Asia Minor, Persia, Indo-China, and Japan. The total volume is very large, but impossible to estimate accurately, for most of it is used locally, and no figures concerning output were available to the Atlas of American Agriculture.

Australia's Wide Choice.

From the above it will be seen that Australia has an immense number of varieties to choose from, and the nature of the choice made will greatly affect its future position in the cotton world. The long staple cottons, as mentioned above, are the most valuable, and it is hoped that these will grow successfully in the irrigated districts. The experience of Egypt and of the Western States of America certainly gives good warrant for this hope, which has been further confirmed by experiment. In many parts of Queensland also cotton of a long staple can be, and has been, grown without irrigation, so that one may venture to believe it will always constitute most of the crop.

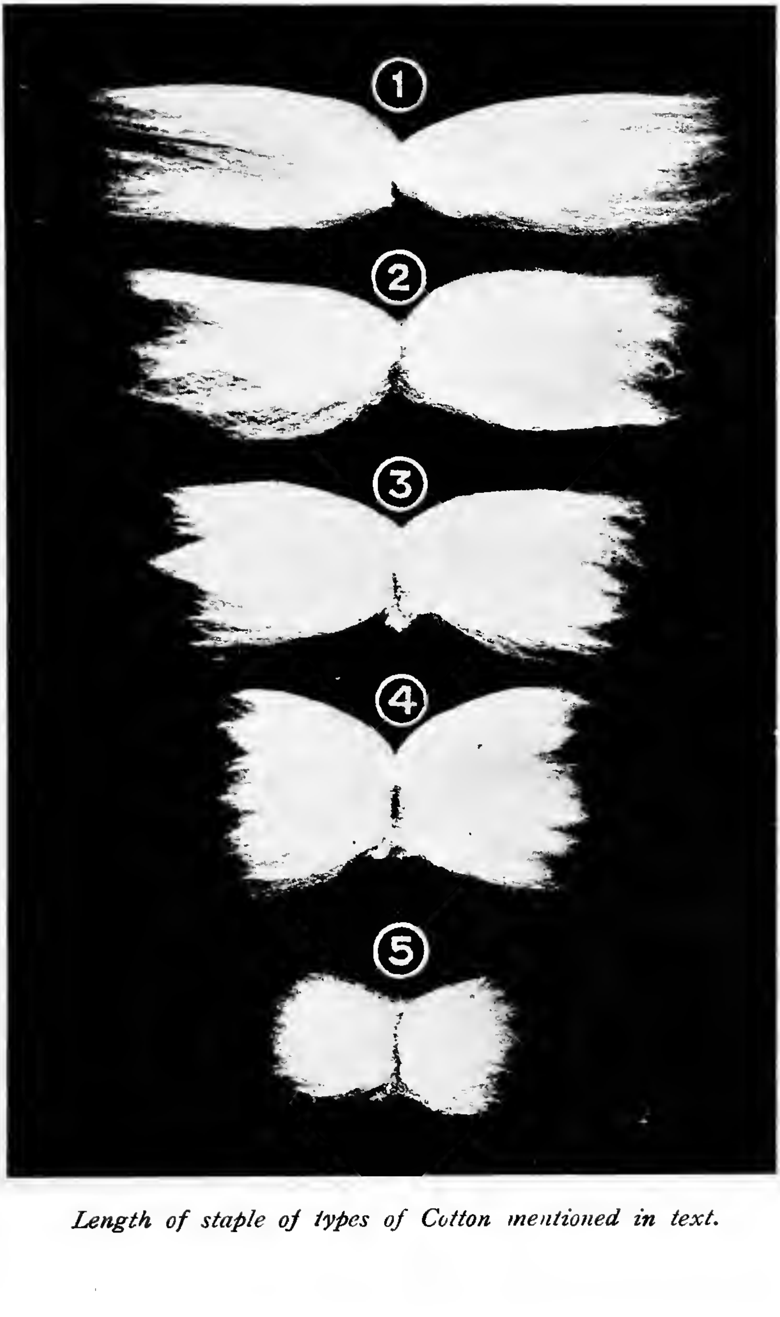
Soils That Suit Cotton.

Cotton, in order to grow prolifically, requires a good soil, but is nevertheless very adaptable. In the United States it grows on practically all well-drained types of soil, generally giving a smaller yield on sandy uplands, while the most productive soils in normal seasons are dark-coloured clay lands, particularly those rich in lime, and red, brown, and black well-drained river bottom lands. The plant also requires good drainage, and if the subsoil becomes water-logged the roots die away and the yield is greatly diminished. In Egypt at one time it was believed that cotton could not have too much water, but the experience of 1909, when a high flood in the Nile in 1908 was followed by a high and earlier flood of the succeeding year, has dissipated this belief. As a result of too much water in 1909 the Egyptian cotton crop was reduced by about one-third, with a resultant loss to the country of some £10,000,000. From this even the fellaheen or native cultivators, who had hitherto been incorrigible in their practice of flooding their fields to any extent that the supply made possible, have learnt a lesson, and the Government has since spent very large sums, amounting to about £10,000,000, on a great drainage system to relieve the cotton lands of surplus water.

Australia, in beginning cotton cultivation on a commercial scale, is fortunate in having the experience of Egypt to work upon, and can avoid the mistakes that have been made there, in growing cotton on irrigated land. As to soil Australia has infinite variety, and accumulated knowledge, supplemented by experiment, will show what types of soil are best suited to various kinds of cotton.

Australian Climate Favourable.

Next to soil as a factor in successful cotton culture comes climate, with the three requisites of heat, rainfall, and absence of heavy frost



Length of staple of types of Cotton mentioned in text.

during the growing season. In the southern portion of the American cotton belt planting generally begins about March 20, and grows later as one goes northward, so that in the northernmost portion of the belt the date of the first sowing is April 20. It usually requires two to three three weeks to complete, and is over by about April 15 in the southern districts and May 1 in the northern. Corresponding dates to these in Australia, where the seasons are reversed, would be October and November. In the American Southern States the first picking is generally about five months later than the first planting, and goes on for two to three months This is a very important fact, since it does away with the necessity of employing an excessive amount of labour for the picking; the harvest need not be rushed, but can be gathered gradually.

I am here digressing somewhat from climatic conditions, which, in order to favour cotton, require that there shall be no heavy frost for a period of six to seven months, while the cotton is in the field. In the southern portion of the American cotton belt the frostless season is about 260 days or more in length, and on the northern limits of successful cotton growing about 200 days. This length of immunity from frost, which is of great importance, can be easily matched, or surpassed, as all Australians well know, over very large districts of Queensland and Western Australia, and also on the irrigated lands of the Murray Valley. There is beside rich country, with heavy rainfall and the requisite heat, in other parts of Victoria, which probably have a sufficient immunity from frost to suit the cotton plant, but there is so much land elsewhere unhampered by any doubt in this respect that there is no need at present to make risky experiments.

Method of Planting.

Most people have the idea firmly rooted in their minds that cotton is a difficult crop to grow, and that it requires an immense amount of labour. This, no doubt, results from the fact that in the past it has been grown principally by negro labour in the United States, and by cheap coloured labour in India and elsewhere. In the slave days negro labour was cheap, but in late years negro cotton pickers in some of the American States have often received wages higher than those paid to agricultural labourers in Australia. They have fallen somewhat since, but are still very high, as measured in money, while a negro hardly ever does the same amount of work for his wage that a white man would do.

Cotton, as a matter of fact, is not difficult to grow. Like successful agriculture of every kind, cotton growing requires good and thorough cultivation of the soil, and like other crops, on the poorer lands it requires manure, but experience has shown that the land of Queensland can yield good crops without being fertilised. After the land has been thoroughly ploughed and harrowed, the seed is sown at the rate of about one bushel to the acre in rows, which are drilled usually about three to four feet apart, though the distance varies according to circumstances Later on, when the plants have come up, they are thinned out till they are left at a distance of ten inches to two feet apart in each row. The subsequent labour consists in hoeing and cultivating to keep down the weeds and maintain the moisture in the soil, and in picking the crop.

No machinery is required, and the whole process of cotton growing is, in fact, simpler than that involved in the cultivation of any other crop. Compare it, for instance, with the growing of maize, which is a considerable industry in Australia, and one for which it is never suggested that black labour is required.

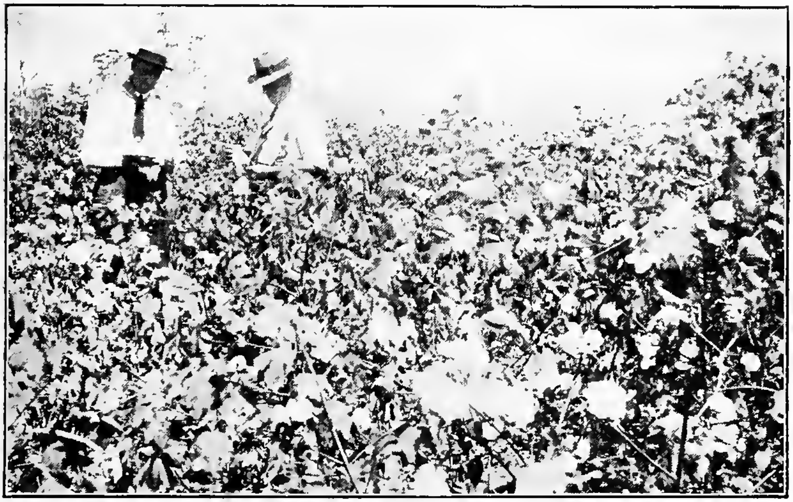
Easier Than Maize To Grow.

For both cotton and maize one must plough, harrow, sow, and cultivate, so they are on a fairly equal footing, though maize must be suckered, and this is not necessary with cotton. Both maize and cotton must be picked by hand. I have no exact recollection of the amount of maize that can be picked in one day, but I believe that, relatively to values, a day's picking of cotton is less expensive in wages than a day's picking of maize. Further, as already stated, the harvest of a cotton field may be gathered gradually in a period extending over two months. Maize must be got in much more quickly, and this entails a greater need of labour.

When the cotton has been picked it is put into bags and carted to the nearest ginnery. From the moment that it is deposited there all the farmer's labour is at an end, and he receives his money on the spot. With maize, on the other hand, when the cobs have been picked the farmer's labour has only just begun. In order to deal with his crop he must have erected bins or sheds for the drying. These cost a considerable sum. He carts his crop, not to a place of sale, but to these sheds, where the cobs must be left for a period of several weeks to dry, after which they must be shelled by hand, or other power, which he has to provide. Then the grain must be bagged and kept to await a favourable market. The farmer has not finished his labour until he has carted the grain to the nearest railway station, and, relatively to value, he has a very much heavier load to carry than the cotton grower, which means that transport absorbs much more of the price that the maize grower receives.

Comparison of Growing Costs.

Let us take some comparative figures. Though maize in some parts of Victoria gives the astonishingly large yield of 100 bushels to the acre and more, its average over the whole of Australia is only about 26 bushels to the acre, and in the United States about 27 bushels to the acre. A crop of 40 bushels of maize in any country is an excellent one. Prices have varied from 2s. 6d. and less to over 10s. per bushel, but 6s. per bushel at the railway station is a very good price in Australia. Forty bushels at 6s. comes to £12 per acre gross. From an acre of cotton the Egyptian grower raises 1,000 lbs. and more of seed cotton, and greater results are obtained in Turkestan and Trans-Caucasia. If this yield is equalled in Australia, as on good lands it should be, and has been, the return at 5½d. per lb. would be about £23 an acre. In order to get his money the maize grower with 40 bushels to the acre has to carry about twice the weight of produce to market in order to receive little more



Cotton Field at Dululin, Central Queensland.

Owner: Mr Arneal.

than half the money that the cotton grower receives; for the weight of a bushel of maize is 56 lbs. No doubt the 5½d. per lb. now guaranteed by the Queensland Government is an outside price, which may not be obtained in the open market, except for especially good varieties, when cotton is grown on a large commercial scale. Nevertheless, a smaller price would still leave a considerable margin in favour of the cotton grower.

Cotton Compared With Tobacco.

Let us now compare cotton growing with tobacco growing, which is a profitable industry in various districts in several Australian States. In the valleys of the Ovens and the King rivers in Victoria yield of half a ton of leaf, at 6d. a lb., pays well, and when the price goes to 9d.. or more, as it sometimes does, very large sums are made from small areas of tobacco. There is very little difference in the weight gathered from a good cotton crop and a good tobacco crop. The price obtained for the latter would be on the average higher; sometimes the yield is heavier, and so far the tobacco grower has an advantage, which is, however, heavily discounted by a number of other circumstances. In the first place, the market for such tobacco as Australia has been able to grow is strictly limited, and to a certain extent artificial, for the maintenance of the price depends on a protective duty, the tobacco not being exported but used only in local manufacture. In the second place, tobacco is exceptionally liable to damage by frost, which may destroy it in a single night, and the crop may be more gradually wiped out of existence by a disease known as the blue mould, the ravages of which no means have yet been discovered to prevent.

Examining Cotton grown on high land.

Cobdogla Irrigation Area, South Australia.

Again, the labour and the capital required in tobacco growing are much heavier than those required by cotton. A tobacco shed must be built, at considerable cost, for drying the leaf. Thorough cultivation is required, just as it is for cotton. When the cotton seed is sown in the rows it subsequently needs only to be thinned out, kept clear of weeds, and picked. Tobacco, on the other hand, must be planted out from specially prepared seed beds, requiring much work and skill to prepare, and every plant must be watered separately when it is put into the ground. At harvest time the plants must be cut by hand and carted to the shed, a big operation, since the weight of the green tobacco plant is four or five times that of the dried leaf. The plants are then hung upon sticks to dry. Later on the leaves are stripped from the stems and placed in piles to "sweat" or ferment. Afterwards they must be packed into bales, the pressing of which needs a good deal of labour, before the crop is ready for the market.

All this, as can be readily seen, involves much heavier work than cotton growing, where the picking of the bolls is a small item compared with the various processes involved in harvesting tobacco. The fact, by the way, that tobacco flourishes in so many parts of Australia in conjunction with maize or corn, as the Americans call it, in itself warrants the presumption that the land is suited for cotton, for in America, in most of the cotton growing States, maize and tobacco are the chief supplementary crops.

Cotton at Woman, property of Mr. Wenck, Central Queensland.

Land cleared August, 1921; planted December, 1921. Photographed March, 1922.

In Egypt, from which Australia has much to learn in cotton growing, various crops are raised during the year upon the land, which cotton only occupies for a few months from start to finish. The planting of the latter is generally preceded by two or three cuttings from a fodder plant, a species of giant clover which yields very heavily, and which is eventually ploughed into the land, enriching the soil with nitrogen and saving an expenditure upon other fertilisers, which are little used in Egypt. On the irrigated lands of the Murray Valley there is no doubt that something of the same kind, with suitable crops, could be done, and on the irrigated cotton lands of America we find another extremely useful example. This is the practice of sowing the cotton between the rows in orchards which have not yet come into full bearing. A successful experiment has already been made with this in Australia, as can be seen in the illustration showing cotton growing between the vines at Renmark, South Australia. This practice on a large scale is of infinite promise, and it is likely to add largely to the area of orchard lands of the Commonwealth.

Cotton in the Orchard.

A settler who takes up a 10 or 20- acre plot at Renmark, Mildura, or the lands irrigated from the Burrinjuck reservoir in New South Wales, now has to wait some four years for a payable return from his orchard, and the number of those who can afford to wait so long is limited.

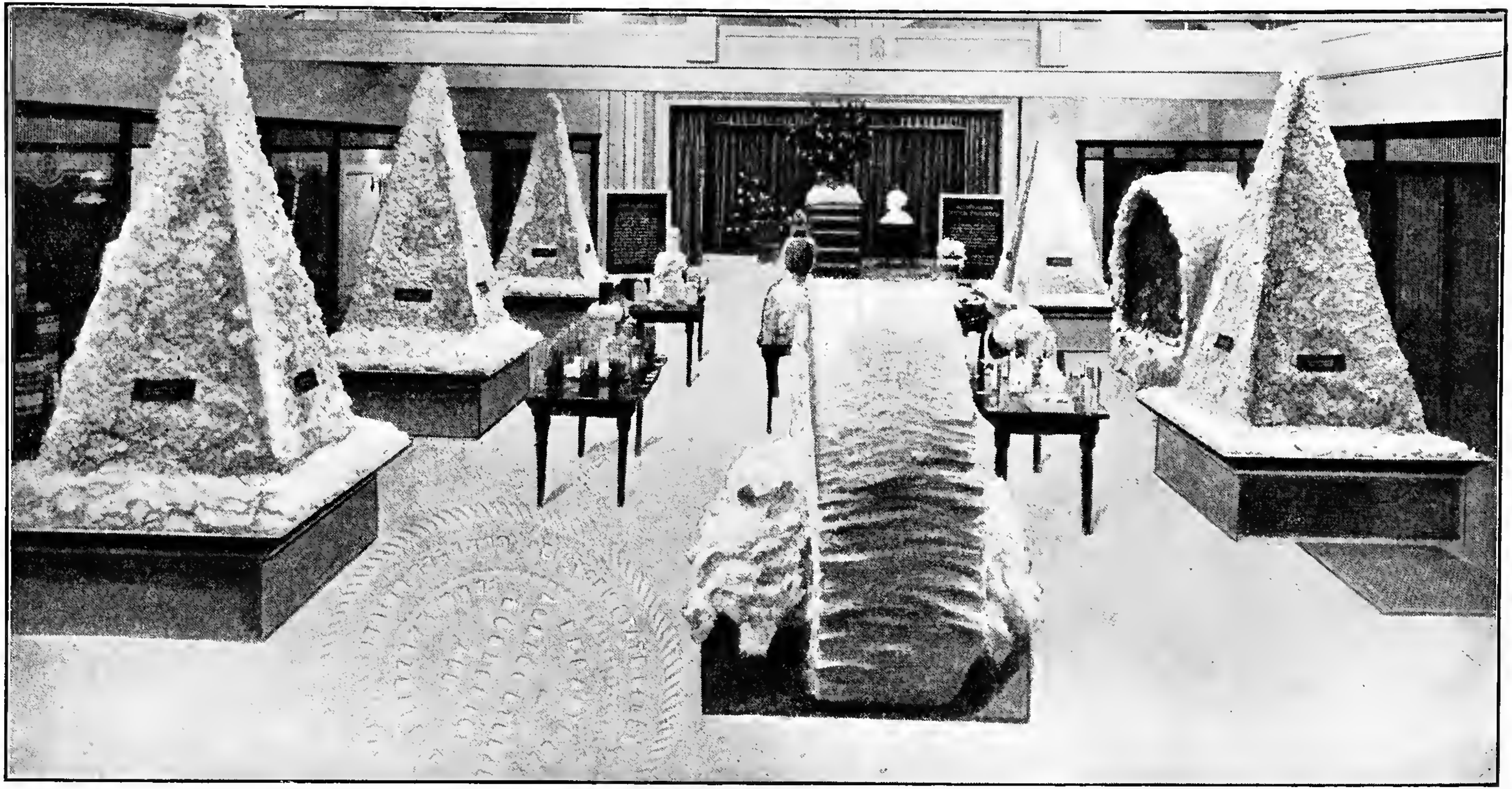
Presuming that cotton growing becomes a flourishing subsidiary industry in these irrigated districts, the position of the orchardist will be totally changed. In the first year of his occupation he can obtain quite a substantial return from his land by sowing a cotton crop, which will mean prompt cash. Within seven months of ploughing the land the money for his cotton will be in the bank.

On an orchard of 10 acres planted with young trees, at the rate of 100 to the acre, there is plenty of room to grow eight acres of cotton. This allows sufficient space for the growth of the roots of the trees and for proper cultivation around them. From that eight acres of cotton the grower should get a gross return of £20 an acre, or £160 in all. The greater part of the labour he will do himself, including the picking of the cotton. If he is a man with a family they will assist in this; if he is a bachelor he will require some other help, which, in an orcharding district, where some of the land already is in bearing, should not be difficult to obtain, for the people who gather the fruit will later be available for picking the cotton.

Pima Cotton at Cobdogla S.A.

Irrigated by pumping from the Murray.

In the United States the amount of cotton picked per day varies considerably according to the type of labour available and the class of cotton grown, but a fair average may be taken as 200 lbs. weight per day In Queensland a girl of 16 has recently picked an average of 160 lbs.



Australian-grown Cotton exhibited in Sydney.

At an exhibition organised by Farmer and Co., June 6 to June 10. [Photo kindly lent by "Times Trade Supplement."

per day. Assuming that the crop yields 1,000 lbs. per acre, the labour required for picking an acre would be five days, and for the eight acres devoted to cotton on a young 10-acre orchard 40 days.

As cotton picking is a process which may extend over about two months, it will be seen that the obtaining of 40 days' work from efficient helpers for the cotton harvest is not a very difficult problem. Making the unlikely supposition that the orchardist picked none of his cotton himself, but employed adult labour at the full wage of 10s. a day, the total cost of gathering his crop would be only £20—not a very serious deduction from a total of £160, which, of course, is subject to further deduction for the other expenses of the crop. These will be considerably less than they would be from any other crop which needs intensive cultivation, and only by intensive cultivation can any adequate return be obtained from irrigated lands.

Rapid Progress in Australia.

Since I began writing this article some weeks ago every day has seen some development in the Australian cotton industry. At this end of the world Mr. Armstrong and other representatives of the Australian Cotton Growing Association have been working hard and successfully at interesting those whose co-operation is essential in making the industry a success by giving its product the best markets; and in Australia itself, pessimism and doubt about the future have given place to confidence and a determination to justify it.

The results of experiments on irrigated and unirrigated lands are uniformly encouraging. Late Australian newspapers give instances of farmers in Queensland making £35 and £40 an acre gross from land cultivated with cotton. Farmer and Co., a great Sydney firm, have held an exhibition, illustrated on another page, of cotton grown in Australia. At this exhibition the Prime Minister (Mr. Hughes) and Mr. Vaughan have made speeches, widely reported, which have arrested public attention, and the Governor-General, Lord Forster, has made himself the apostle of cotton growing in Australia, preaching the value of it far and wide.

In the meantime, the gins already erected in Queensland have been hard at work. An illustration here shows the thousandth bale of Australian cotton ready for export, and a considerable consignment now on the water will arrive within the next few days. From cotton which arrived earlier the first piece goods have been manufactured in England from the Australian article. A long length of the material is a very pleasing sight to Australian eyes, and, what is more important, it gains the high commendation, which I have heard expressed, of leading men in the English cotton trade. They point to certain defects in this particular sample, very slight, and arising from the imperfect ginning of the seed cotton with the old-fashioned machinery, now scrapped, which did the work, but they say that in spite of this it is a remarkably good article, which would command a ready and profitable sale, while they are certain that the lint now arriving, the product of the Australian Cotton Growing Association's ginnery, will produce fabric of still greater value, since the cotton will be perfectly cleaned and ginned.

The Guaranteed Price.

Reference was made above to the receipt by Queensland farmers of sums up to £40 an acre for their season's crop. This wonderful result was obtained on the price of 5½d. per pound for the seed cotton guaranteed by the Queensland Government, and it should here be remarked that the Commonwealth Government and the New South Wales Government are now sharing the responsibility for guaranteeing a similar price for cotton grown in New South Wales. There is little doubt that Victoria, South Australia, and Western Australia will fall into line by providing guarantees, and in order to encourage the pioneers in such a vitally important and promising industry it is highly desirable that they should. At the same time, it must be clearly understood by all of us who look to seeing Australia one of the greatest cotton countries in the world, that the industry must eventually stand upon its own feet, without artificial support from the Government. Only in its infancy can it appropriately be spoon-fed.

This consideration leads to the question whether the 5½d. now guaranteed is an economic price, and whether, when it is withdrawn, the cotton of Australia can command a price on its merits which will give the grower a full return for his capital and labour. First it must be admitted that 5½d. per pound for seed cotton is a very high price. On the average it takes three pounds of cotton in the seed to produce one pound of lint, so that 5½d. per pound for the former represents about 1s. 2d. per pound for the latter. It would have to be more to enable 5½d. to be paid for seed cotton but for the fact that the seed has a considerable value, and it constitutes about two-thirds of the cotton sold to the ginnery. From cotton seed are made oil and oilcake for feeding stock, the latter consisting of the crushed seed after the oil has been expressed from it. Owing to new methods of treating cotton seed oil, especially one which enables it to be converted into a solid fat, edible or otherwise as required, it is much more valuable than it used to be, and in Australia the seed from the 77,000 acres of cotton planted this year will be a considerable item.

A Cotton-picking Machine in America.

From "The World's Cotton Crops" by Professor J. A. Todd (A. & C. Black, Ltd.).

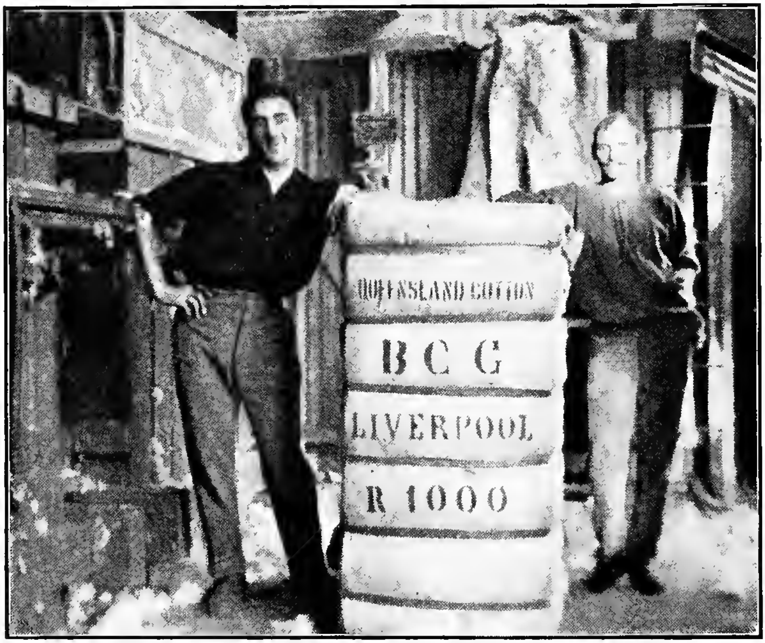
Supposing, then, that the Government which guarantees the growers 5½d. for seed cotton must obtain a price of 1s. 2d. per pound, or thereabouts, for the lint in order to avoid loss, the question remains, can it do so?

The answer depends upon the quality of the cotton grown. American short staple brings nothing like this price—only on the average a little more than half—but Australian cotton, even in the past, has been of much higher grade, and I understand that 595 bales of it have actually been sold in England at a commercial price of 1s. 3¼d. per pound. Freight and other charges would, of course, have to be deducted from this price, but the fact that it was obtained, and the fact that the British Cotton Growers' Association has given a guarantee to purchase approved Australian lint of certain varieties at 1s. 6d. per pound, limiting its loss to £10,000, shows that 5½d. for seed cotton is not an impossible price at which to aim.

The important thing, however, is that a much lower price will pay, and pay well. If the grower obtains 4d. per pound his cotton fields will give him a splendid return; if he gets 3d. per pound, a price which, with reasonable industry and skill in cultivating good varieties, should be always within his reach, there are few other crops in Australia that will pay him so well.

An Estimate of Expenditure and Receipts.

Let us look at some figures on this basis and estimate the results from 100 acres of cotton grown on a mixed farm of, say, 300 acres in the natural rainfall country of Queensland, or Northern New South Wales.



The Thousandth bale of Cotton from Rockhampton Ginnery.
Baled June, 1922.

Assuming that the cotton is grown on good land, worth £20 an acre—some would cost more, some much less—the rent of 100 acres at 6 per cent. would be £120. Interest and depreciation on £300 worth of plant at 10 per cent. would be £30. This is a liberal allowance, seeing that the ploughs, waggons, horses, etc., on the farm would be used only partly for cotton cultivation and partly for other purposes.

Manure will not be required at all on some lands, where a fodder crop, such as rape, can be grown and fed off with sheep on the land subsequently planted with cotton. Let us, however, put down the sum of 10s. per acre for artificial fertilisers.

These three items make together £200, or £2 per acre, which seed at 5s. per acre will bring to £2 5s. per acre.

The rest of the costs can be most conveniently reckoned in labour days for men and horses. The result will be somewhat as follows:—

	Days.
Ploughing	50
Harrowing	10
Cultivating with Massey Harris or similar cultivator ...	10
Sowing	25
Horse hoeing	30
Hand hoeing and weeding	50
Picking 100,000 lbs. at 200 lbs. per day	500
Carting, 10 miles	12
Incidental labour	13
Total	700

Assuming that the ploughing is done with a two-furrow plough, drawn by three horses, at the rate of two acres a day, that four horses are used for carting, two with the harrows, three with the Massey Harris cultivator, and one with the horse hoe, the number of days' work for one horse would be 278 days. Divided by seven, this gives practically 40 weeks. The cost of horse feed, at 12s. 6d. per week, would add £45 to the cost of the crop.

There remains the labour—700 days. Let us put the cost of this at 10s. per day, and the total cost will be £350. As previously stated, everything goes to show that good land, sown with good seed, and cultivated as thoroughly as the operations scheduled above allow, ought to yield in Australia 1,000 pounds per acre of seed cotton, and frequently more. The price assured is the moderate one of 3d. per pound. We now have the data for striking a balance between expenditure and receipts as follows:—

100 ACRES OF COTTON ON AN AUSTRALIAN MIXED FARM.

Expenditure.		Receipts	
Rent	£120	100,000 lbs. of seed cotton at 3d. per lb.	£1,250
Interest on capital	30		
Seed	25		
Labour	350		
Manure	50		
Horse feed	25		
	£600		

BALANCE PROFIT £650.

There is no other crop in Australia from which the farmer in a good year, on an area of 100 acres, can make a net profit of £6 10s. per acre, without much greater preliminary expenditure of capital, much more labour, and much more specialised knowledge and skill, such as that required in growing the highest grades of fruit.

The return is, in fact, remarkable, and it allows a large margin consistent with an excellent profit for a smaller crop, a slightly lower price for the cotton, or a higher price for picking. The rate here allowed is 10s. for a day's pick of 200 lb. This amount is picked in Texas; it is, indeed, frequently exceeded; but in Australia, until special skill is developed it may not be reached. On the other hand, much of it will probably be done by women or children at a lower wage than 10s. per day.

No managerial expenses are allowed in the above estimates. The profit is the owner-manager's wage, and in the Australian style he will usually save a good deal of the labour cost scheduled, by doing the work himself.

I do not claim that every item of labour time for man or horse set down here is absolutely accurate, but on Australian farming practice it is very near the mark, and I believe the total cost of labour allowed is very liberal. Mr. Johnston, when touring with Messrs. Vaughan and Armstrong in the Commonwealth, endeavoured to ascertain the actual cost of cultivation as followed there. He said that he found it practically impossible to obtain any reliable figures, but two farmers in Queensland estimated the cost of cultivation at £3 10s. per acre, and picking at 1d. per lb. This would make the total cost of a 1,000 lb. per acre crop £7 10s. per acre, against mine of £6. At £7 10s. there is still a profit of £500 on 100 acres at 3d. per lb., and Mr. Johnston says that samples of cotton grown by the men who gave this estimate, and taken to England by him, were valued at 10d. and 1s. per lb., which represents more than 3d. per lb. for seed cotton.

Unless and until some serious flaw in my estimate is shown by experience, with allowance for a possible extra cost of a few shillings per acre for picking it should be taken as a very fair guide to the cost of growing cotton, and the fact that the equivalent of two active men's labour for a year will do almost the entire work of a cotton plantation of 100 acres, disposes absolutely of the bogey that cotton is only a black-labour crop.

The managers in London for the Australian Cotton Growing Association are Messrs. Chalmers, Cuthrie and Co., Ltd., of 9, Idol Lane, London, where further information as to the work of the Association can be obtained.

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